# Cognitive Dissonance, Knowledge Instinct and Musical Emotions

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My starting point for this commentary is Perlovsky's suggestion that cognitive dissonance is a similar concept to "damaged" cognition due to differentiation, and a possible framework to test his hypotheses that the major role of musical emotions is to reconcile contradictions in consciousness, i.e., to restore "synthesis" (Perlovsky, *in press*). I will first analyze and address the commonalities between both phenomena. Then, I will briefly discuss the specialization of music as a referential for emotion, and propose an experimental framework to test the capacity for music to reduce cognitive dissonance and to promote the acquisition of differentiated knowledge.

The term cognitive dissonance was coined by social psychologist Leon Festinger back in the 50's, to define a psychological state in which an individual's cognitions (attitudes, beliefs, values, and other element of knowledge) are in conflict, giving rise to a noxious experience (or psychological discomfort) (Festinger, 1957). The central background to this theory consists in the conception that a fundamental human principle is to be impelled to resolve the inconsistencies between dissonant cognitions in order to reestablish a state of harmony. The intensity of such pressure is proportional to the magnitude of dissonance, and its reduction is achieved through three major strategies: changing one or more dissonant elements, adding new cognitive elements congruent with pre-existent ones or by underestimating the relevance of the elements involved in the dissonance relation.

My first observation is that Festinger's theory of cognitive dissonance is indeed closely related with the concept of "damaged synthesis" discussed by Perlovsky. Both phenomena arise from the perception of inconsistencies among related cognitions with direct consequences to the individual, since the awareness of this inconsistency (which causes the dissonance) motivates the organism to resolve it. Moreover the mismatch between one's cognitions gives rise to an uncomfortable feeling resulting from holding contradictory cognitions, either in relation to interactions with the outside world, or in respect to conceptual knowledge within one's mind. If generally both concepts (cognitive dissonance and damaged synthesis) resemble each other, there are nevertheless two fundamental aspects which require further clarification: one is the substrate (and origin) supporting this "drive" or "motivational state" to reduce (and ultimately resolve) the dissonance (or "damaged synthesis"); the other consists of the reasons that both theories suggest for this phenomenon to be accompanied by some sort of feeling.

Regarding the first aspect, Festinger explicitly states that "the existence of nonfitting relations among cognitions, is a motivating factor in it own right", thus "cognitive dissonance can be seen as an antecedent condition which leads to activity oriented toward dissonance reduction just as hunger leads to activity oriented toward hunger satiation" (Festinger, 1957, page 3). Such a statement clearly defines a principle to reduce the intrapersonal state aroused by the inconsistencies in cognition, but falls short when it comes to explain the mind mechanisms of the origin of such principle (other than proposing that consistency of thought is a strong motivating factor). Moreover, Festinger acknowledges that dissonance theory does not deal with the relationships with other motivations, i.e. it fails to place such mechanism in the hierarchy of the mind and especially to justify its conscious nature and affective qualities.

Although not specifically tackling the resolution of dissonant cognitions, but instead a more general theory of mind, Perlovsky presents compelling arguments to explain the origins (and evolutionary advantage) of such mechanism by introducing the concept of the "Knowledge Instinct" (KI). He suggests that the evolution of the human mind required a specific mechanism to measure and maximize the similarity between internal "concept-models" and the world/reality itself, while constantly resolving contradictions between individual and multiple related concepts. Such a mechanism operates with two main mechanisms: differentiation – promoting a sophisticated understanding and representation of the world "*by creating more specific, diverse and detailed concepts*" – and synthesis – promoting a harmonious matching of knowledge and understanding across the different hierarchical levels of the mind, connecting instinctual needs and knowledge by means of emotions. Unlike Festinger, Perlovsky's theory can explain the accompanying affective qualities of the dissonant experience, by

relating grounding it on instinctual needs and explicitly quantifying their degree of relatedness in term of emotional states. It is not only interesting to observe that within the same model the accompanying affective qualities of such experiences can be explained, but conspicuously they occupy a key role in the evolution of cognition and culture[1].

We get now to the second point I would like to discuss: Perlovsky's assertion that the role of music emotions is to support the development of this "emotional space" and the acquisition of "*differentiated contradictory knowledge*", following the increasing dimensionality of the "conceptual space", i.e. the complexity of the internal model of the world, especially after the appearance of language. This is the fundamental argument in Perlovsky's model of the mind that conveys important information regarding the origins and evolution of music. Accordingly to Perlovsky, concepts relate to each other by means of aesthetic emotions (emotions related to knowledge), by attaching "affective labels" to each other. Every mismatch/conflict/dissonance needs a proper "label" to characterize it and ultimately to allow the acquisition of differentiated contradictory knowledge while maintaining the wholeness of the mind (synthesis). In this way, the evolution of the KI mechanism (cognitive dissonance would be a particular emergent phenomenon), is associated with the emergence of a comparable multitude of emotions that characterize the multitude of affective experiences characterizing the relationships between synthesis and differentiation within the human mind. If language appeared and evolved toward enhancing conceptual differentiations, then a different system, with privileged access to emotional centers, would be required to evolve in parallel in order to maintain the unity of the psyche: music.

To begin with, such a hypotheses fits an evolutionary perspective on language and music in terms of specialization. Language evolved in a more conceptual way, while musical experiences are often intertwined with emotional ones, since most music promptly evokes some sort of affective response. Such phenomenon seems to arise from the fact that the spatio-temporal acoustic patterns of music automatically elicit a natural response in certain basic neurological mechanisms, giving rise to profound changes in the body and brain dynamics, and to the interference with ongoing mental and bodily processes. This specialization of the musical faculty would certainly convey a privileged means to support the development of an increasingly complex emotional model within the mind, since it interacts with our social-emotional brains in very particular ways, coaxing us to experience a wide range of emotions and allowing us to savor a much wider range of affective experiences. One of the great mysteries of music is the fact that these include not only a few dimensions (e.g. basic emotions), but also a whole range of complex and yet undefined (in great part due to the lack of understanding of its underlying mechanisms, see Juslin & Västfjäll, 2008) affective states. In this regard, Perlovsky's hypothesis for the role of music in the evolution of human cognition, contributes to the understanding of the origins of music, its evolution toward a universal faculty, and its purposiveness[2].

In the last part of this commentary, I would like to mention one of the basic mechanisms through which emotions can support the resolution of dissonance, since their experience may overrule other psychological motivations by interfering with the commitment to discontinue or support conflicting knowledge. In other words,

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[1] It is important to point out that comparative-developmental research would be fundamental for detecting such a mechanism and validate Perlovsky's model. I won't go into detail about such research, just mention that (Egan, Santos & Bloom, 2007) suggest that preschoolers (4 years old children) and capuchin monkeys exhibit changes in their attitudes due to the fact that they made cognitive-dissonance-induced decisions. Such evidence raises the possibility of the existence of core aspects of cognition that give rise to cognitive dissonance reduction behaviors. Moreover, this study shows that both children and primates exhibit similar behavior, this hints in the direction that this mechanism may have evolved due to evolutionary and developmental constraints, thus reinforcing the Perlovsky's argument on the existence of a KI mechanism.

[2] Language maintained, apparently universally (Thompson & Balkwill, 2006), prosodic mechanisms closely related to expressions of emotions. Some have suggested this to be closely related to the evolution of the music faculty; behavioral and neurological studies suggest that the expression of emotion in music and speech is dependent on some of the same structural-auditory mechanisms (see Juslin & Laukka, 2003 for a review). Moreover, musical behavior and vocal communications also share common ancestry (Brown, 2000; Dissanayake, 2000) and are related by overlapping neural resources (Deutsch, Henthorn, & Dolson, 2004). Nevertheless, the prosodic aspects of speech (which serve emotional communication purposes and also reflect various other features of the speaker and the utterance) seem to be more consistent in differentiating discrete affective states, especially in terms of arousal (e.g. Laukka, 2004), while music seems to embody emotion *per se*, conveying a much more complex set of affective meanings.

manipulations of the emotional state aroused by the dissonance could drive the organism to give in to the differentiation and promote its integration (synthesis). In this regard, important evidence has been presented by Cooper, Zanna and Taves (1978). By manipulating the arousal state of a group of university students through the administration of tranquilizing and excitatory drugs, the authors have shown that the dissonance effect could be eliminated in the first condition and enhanced in the second. This is a hefty result since it demonstrates that the dissonance experience can be altered through the manipulation of psycho-physiological states, an effect that can also be achieved by listening to music.

I would like to conclude by asserting that any empirical paradigm that addresses the role of music in the acquisition of differentiated knowledge by means of the cognitive dissonance theory must restrict the involvement of strategies of dissonance resolution, either the ones suggested by Festinger or the ones suggested in subsequent reviews of his original theory (see Harmon-Jones & Milles, 1999). At least an adequate control condition is necessary. On this ground, Perlovsky's theory on the role of musical emotions in promoting the unity of the mind could be tested.

References


Brown, S. (2000). Are Music and Language Homologues? In N. L. Wallin, B. Merker, & S. Brown (Eds.), *The origins of music* (pp. 271-300). Cambridge, USA: MIT Press.

Cooper, J., Zanna, M.P. & Taves, P.A. (1978). Arousal as a necessary condition for attitude change following induced compliance. Journal of Personality and Social Psychology, 36(10), 1101-1106.

Deutsch, D., Henthorn, T., & Dolson, M. (2004). Absolute Pitch, Speech, and Tone Language: Some Experiments and a Proposed Framework. *Music Perception*, 21(3), 339-356.

Dissanayake, E. (2000). Antecedents of the temporal arts in early mother-infant interaction . In N. L. Wallin, B. Merker, & S. Brown (Eds.), *The origins of music* (pp. 389–410). Cambridge, USA: MIT Press.

Egan, L.C. and Santos, L.R. and Bloom, P. (2007). The origins of cognitive dissonance: Evidence from children and monkeys. *Psychological Science*, 18(11), 978-983.

Festinger, L. (1957). *A Theory of Cognitive Dissonance*. Stanford (CA), USA: Stanford University Press.

Harmon-Jones, E. & Mills, J. (Eds.). (1999). *Cognitive dissonance: Progress on a pivotal theory in social psychology*. Washington, DC, USA: American Psychological Association.

Juslin, P., & Laukka, P. (2003). Emotional Expression in Speech and Music: Evidence of Cross-Modal Similarities. *Annals of the New York Academy of Sciences*, 1000(1), 279–282.

Juslin, P.N. & Västfjäll, D. (2008). Emotional responses to music: The need to consider underlying mechanisms. *Behavioral and Brain Sciences*, 31(5), 559-575.

Laukka, P. (2004). *Vocal expression of emotion: Discrete-emotions and dimensional accounts*. Unpublished doctoral dissertation, Uppsala University, Sweden.

Perlovsky, L. (*in press*). Musical Emotions: Functions, origins, evolution. *Physics of Life Reviews*.

Thompson, W.F. and Balkwill, L-L. (2006). Decoding speech prosody in five languages. *Semiotica,* 158 (1/4), pp. 407-424.